APPENDIX 1. REPORT FORMAT AND DESCRIPTION OF METHODOLOGY FOR DETERMINING OVERFISHING STATUS

The format of the report is the same as the 2000 report. Information on necessary management actions to be taken and progress being made in rebuilding overfished stocks is provided. Determinations are presented separately for those stocks where overfishing is occurring, i.e., the fishing mortality rate is above an identified threshold; and for those stocks that are overfished, i.e., the biomass of the stock is below an identified threshold. Data concerning each of these categories are not additive and could result in double counting if added together to determine the combined status of the stocks. The categories not overfished and approaching an overfished condition are mutually exclusive. Any stock listed as approaching an overfished condition (because it is estimated that it will become overfished within 2 years) is not included in the not overfished category, even though it is currently not overfished. This is to eliminate double-counting of the stocks analyzed in this report. Overfishing and overfished definitions are listed in Appendix 2.

Determining Status of Stocks

If the fishing mortality rate is above the threshold, then overfishing is occurring. If the stock size is below the minimum threshold, then the stock is overfished. The overfishing and overfished categories are separate determinations and should not be added together, because this would result in double-counting for many of the stocks.

In addition, if a stock size is expected to fall below the threshold level necessary to produce MSY within 2 years, then it is listed as approaching an overfished condition. Determinations are based on the criterion in the FMP for the overfished (biomass) component and trends in various indicators relative to that criterion. For some stocks, pre-SFA definitions, including proxy MSYs and minimum stock size threshold, were used as a basis in determining whether a stock was approaching an overfished condition.

For salmon stocks contained in the WA, OR, CA FMP, determining whether a stock is approaching a condition of being overfished is based on a different, albeit analogous, set of criteria. A conservation alert is triggered during the annual preseason process if a natural stock or stock complex is projected to fall short of its conservation objective (MSY, MSY proxy, MSP, or floor, in the case of some harvest rate objectives) for one year. The criteria used by the PFMC is more conservative than recommended under the National Standard Guidelines, and a one-year departure from the MSY/MSP spawner objectives does not necessarily mean that the stock will be unable to produce MSY in the long-term.

Stock assessments may be based on fully approved overfishing definitions that specify both a maximum fishing mortality rate threshold and a minimum stock size threshold, or assessments may be based on partially approved or fully disapproved definitions. If a partially approved definition exists in the FMP, the determinations were made using the approved portion of the definition and the pre-SFA definition in the FMP for the disapproved portion of the definition, if available. Many of these pre-SFA definitions have been contained in their respective FMPs for years, were approved prior to the SFA amendments, and remain the operative definition, if the proposed SFA definition was disapproved. In some cases, a pre-SFA definition is not available to base a determination on, causing undefined to be noted in the appropriate column. For fully disapproved definitions, this year's report again uses the pre-SFA definition. If neither post- nor pre-SFA overfishing and overfished definitions are contained in the FMP, the stock will be listed as undefined in both of these categories.

Pre-SFA and Post-SFA Definitions

This report divides the overfishing and overfished columns into pre- and post-SFA overfishing definitions to make the basis for the determinations as clear as possible. The approaching an overfished condition column does not make a distinction between pre- and post-SFA. Since a stock is considered to be approaching an overfished condition if it is likely to become overfished in two years, it is generally based on stock level indicators. The type of overfishing definition (pre- or post-SFA) used to determine if a stock is approaching an overfished condition is based on the criteria associated with the biomass (overfished) component of the definition.

Final Conclusions

Because the overfishing definitions used to assess stocks contained in this report have changed over the years, it is difficult to make year-to-year comparisons of stocks. Removal of the third column (overfished) that was used in reports prior to 2000 also makes direct comparisons difficult. Nevertheless, the determinations in the fishing mortality rate column in previous year's reports can be compared with the determinations in the overfishing column this year. Likewise, the determinations in previous year's biomass column can be compared to the overfished column in the 2001 report.

Rebuilding Progress

Information is provided about those stocks for which rebuilding programs are required. By identifying the type of management action required when overfishing is occurring or when a stock is overfished, it is possible to correctly note which stocks require reduction of the fishing mortality rate and which stocks actually require rebuilding plans. The progress of each rebuilding plan is indicated in the last column of the table, giving information about the number of years the program has been in place, and the total number of years the program is expected to exist. Some plans were approved prior to the SFA amendments and are footnoted accordingly, and those for which there is no defined time line are also noted. For purposes of this report, December 2001 is used as the cutoff date for determining the year in which the rebuilding plan is currently in.

Any stock that has previously been listed, or is currently listed, as overfished is required to have a rebuilding program until the stock has been rebuilt to levels that are consistent with supporting MSY on a sustainable basis. Stocks that are overfished that do not have a rebuilding program are listed as "rebuild program" in the Management Action Required column, which indicates that a rebuilding program is required for this stock. Overfished stocks that are listed as "continue rebuilding" in the Management Action Required column are currently rebuilding under an approved rebuilding program. Stocks that are listed as not overfished - rebuilding were previously below the minimum stock size threshold, are now above that level, but have not been rebuilt to the target levels specified in their rebuilding plans. These stocks are currently rebuilding under an approved rebuilding plan, and are listed as "continue rebuilding" in the Management Action Required column. Three exceptions are Gulf of Maine Haddock, Cape Cod Yellowtail Flounder, and Georges Bank Winter Flounder, which are rebuilding under rebuilding programs for other groundfish stocks. The status of these stocks is likely to improve as a result of these measures, but because they were previously listed as overfished, a formal rebuilding program is still required for them. It is important to note that the status of rebuilding stocks should not be considered as healthy until they have been fully rebuilt.

METHODOLOGY FOR STATUS DETERMINATIONS

Basis for Determining Status of Overfishing

As required by section 304(e)(1) of the Magnuson-Stevens Act, the status determination for those stocks managed under an FMP or international agreement was based on the criteria (i.e., the overfishing definition) specified in the FMP or agreement, whenever possible (see Appendices 2-5). Prior to requirements under the SFA, most existing overfishing definitions were based wholly or in part on either a fishing mortality rate or stock biomass, but not both. The SFA requires that status determination criteria must specify both a maximum fishing mortality threshold or reasonable proxy thereof, and a minimum stock size threshold or reasonable proxy thereof. Thus, stocks must be assessed according to whether the maximum fishing mortality threshold is being exceeded and whether the stock is below the minimum stock size threshold. Overfishing is determined to be occurring for those stocks for which the fishing mortality rate exceeds the fishing mortality rate or level required to produce the maximum sustainable yield (MSY) on a continuing basis. Overfished stocks are those whose biomass is below the minimum stock size required to produce MSY on a continuing basis.

In conformance with SFA requirements, this report identifies the status determination of stocks based on both the fishing mortality rate and stock biomass, wherever possible. The National Standard Guidelines require NMFS to determine whether the fishing mortality rate threshold is being exceeded or the biomass is below the established threshold for each stock. If either overfishing is occurring or a stock is being overfished, management action is required. For stocks in which overfishing is occurring, fishing mortality must be reduced so that stocks can produce MSY on a continuing basis; for stocks that are overfished, rebuilding plans must be implemented so that stocks can be rebuilt to the level necessary to produce MSY on a continuing basis. The following is a description of the basis for status determinations under a variety of scenarios associated with fully approved, partially approved, or fully disapproved definitions.

Fully Approved Definitions under the SFA: For those stocks contained in FMPs for which overfishing definitions were fully approved, status determinations were based on assessments using both the fishing mortality rate and biomass definitions, wherever possible. If the fishing mortality rate exceeded the established fishing mortality rate threshold, the stock was listed as "overfishing is occurring." If the biomass was below the established biomass threshold, the stock was listed as "overfished." Stocks listed as unknown are those for which there is an approved overfishing definition, but for which no determination can be made because of insufficient information.

Partially Approved Definitions under the SFA: For those stocks contained in FMPs for which overfishing definitions were partially approved (i.e., for which only one of the two necessary criteria was approved), status determinations were based on the definitions that are currently in the FMP. For some stocks, determinations were made using a combination of the SFA approved definition, such as the fishing mortality rate, and the pre-SFA definition, such as stock level size. For other stocks, the only overfishing definition contained in the FMP is one component (fishing mortality or biomass) that meets SFA requirements. For these stocks, determinations were made using the SFA approved criterion, and the other component was listed as undefined. Stocks listed as undefined are those for which there is no status criterion by which to make a determination.

Definitions under the SFA that are Fully Disapproved or Still Under Review: For those stocks contained in FMPs for which the overfishing definitions were fully disapproved or are still under review, status determinations were based on previously existing definitions, and were assessed under pre-SFA guidelines. Similar to partially approved definitions, the overfishing or overfished determination was based solely on the status criterion that is available. When a status criterion is not available the stock is listed as undefined.

Stocks contained in Federal FMPs for which Definitions do not Apply: Some stocks contained in federal FMPs have never had an overfishing or overfished definition. Such stocks are usually minor and are contained in federal FMPs in which overfishing definitions exist, but the definitions do not apply to these stocks. The status of such stocks are listed as undefined.

Fully or Partially Approved Definitions contained in Non-Federal FMPs managed by Interstate Fishery Management Commissions: While there are no SFA requirements for stocks contained in non-federal FMPs to have both a fishing mortality rate and biomass definition, some may contain one or both of these components. For stocks in which both components were approved, the status determination is based on these definitions. For stocks in which there is only one component to make a determination (either overfishing or overfished criteria), the status determination is based on the approved criteria, and the other component is listed as undefined. Pacific Halibut, which is managed through an international treaty between the United States and Canada is listed according to these same guidelines. Management measures are coordinated jointly by the PFMC and NPFMC in U.S. waters, and it is likely that this regime will continue.

Stocks not contained in FMPs, stocks contained in FMPs under development, and stocks contained in Non-Federal FMPs managed by Interstate Fishery Management Commissions for which there are no Definitions: For these cases, if overfishing definitions are available for either component, they will be used to make the status determinations. If definitions are not available the stock will be listed according to the status determination in OLO. If there is no basis for making a determination listed in OLO, the stock is listed as unknown.

The 1999 edition of Our Living Oceans (OLO) was used to determine the status relative to overfishing for stocks (1) for which there are no FMPs or international agreements and there are no overfishing definitions, but that are under the Councils' geographic area of authority or under the Secretary's management authority for Atlantic highly migratory species; (2) that are contained in FMPs under development and do not have overfishing definitions; and (3) that are contained in non-federal FMPs managed by an Interstate Fishery Management Commission and there are no overfishing definitions. In OLO, the terms overfished and overfishing are not used, but similar concepts are. Long Term Potential Yield (LTPY), as used in OLO, is analogous to MSY. Thus, the conclusions reached in OLO approximate the conclusions that would be drawn if an assessment had been made using the SFA's definition of overfished. Stocks that are listed in OLO as below stock levels necessary to produce LTPY are considered overfished, and those listed as near and above stock levels necessary to produce LTPY are considered not overfished. In determining whether overfishing is occurring, the existing fishing effort or fishery utilization level was compared to the level necessary to achieve LTPY. Stocks that are listed in OLO as over are stocks for which overfishing is occurring, and those that are listed as under or fully are stocks for which no overfishing is occurring. Because OLO does not make a determination of whether the stock is approaching an overfished condition, that determination could not be made for those stocks assessed using OLO. For stocks not contained in FMPs that have no overfishing definition or for which there is no determination of stock status in OLO, the overfished status is listed as unknown.

Many of the stocks listed as overfished in this report have experienced excessive levels of fishing effort in recent years, and appropriate measures have been taken to reduce fishing mortality on these stocks. Other stocks listed as overfished may be due to prevailing environmental conditions, habitat degradation, or natural fluctuations in the stocks. These factors may have reduced the stock biomass to levels below that which is necessary to produce MSY on a continuing basis. Sometimes, management measures have little impact on the status of the stocks. For example, many of the Pacific salmon stocks under the PFMC jurisdiction are not significantly impacted in fisheries within the Council's jurisdiction. Other stocks are listed as threatened or endangered under the Endangered Species Act and management for these stocks is conducted under the ESA. Fishing effort has been appropriately reduced or eliminated, but the stocks remain overfished due to factors beyond the Council's control. While the Councils, NMFS, and any management regime will make every effort to implement appropriate management measures, rebuilding programs may not necessarily restore some stocks to a healthy level, until these other factors are effectively dealt with.

Information regarding the status of stocks is continually evolving and additional information has become available for some stocks since the most recent publication of OLO. For those stocks for which there is updated information in a citable form, that information was used to determine the status of that stock in this report. It is recognized that this approach does not include all "preliminary" information for each stock. However, this approach has been taken to minimize potential confusion as conclusions about stock conditions change with changes in "preliminary" information.

APPENDIX 2. OVERFISHING DEFINITIONS CONTAINED IN FEDERAL FISHERY MANAGEMENT PLANS

The following definitions are as contained in the Fishery Management Plans, with minor editing changes to maintain consistency of terms. See Appendix 6 for definitions of acronyms used in this appendix.

Atlantic Sea Scallop – The following overfishing definitions have been fully approved under SFA guidelines and were used to make the assessments contained in this report. The definitions contain both a fishing mortality rate (F) and biomass (B) component.

Georges Bank - Overfishing occurs when F exceeds F_{max} (proxy for F_{msy}), when the stock biomass is equal to or greater than B_{msy} or when F is greater than zero if stock is below ¼B_{msy}. The best available estimate of F_{max} is 0.24.

A stock is overfished when stock biomass is below ¼B_{msy}. Proxy for B_{msy} is defined as 8.16 kg/tow (SAW-32, 2001).

Middle Atlantic - Overfishing occurs when F exceeds F_{max} (proxy for F_{msy}), when the stock biomass is equal to or greater than B_{msy} or when F is greater than zero if stock is below ¼B_{msy}. The best available estimate of F_{max} is 0.24.

A stock is overfished when stock biomass is below ¼B_{msy}. Proxy for B_{msy} is defined as 3.90 kg/tow (SAW-32, 2001).

Atlantic Salmon - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing is currently not defined (fishing mortality is set equal to zero).

A stock is overfished when the stock biomass falls below B_{MSY} (54,000 spawning salmon is set as a proxy for $B_{MSY)}$. The estimate of B_{MSY} has not been revised since the 2000 report.

Northeast Multispecies

Cod - The following overfishing definitions have been fully approved under SFA guidelines and were used to make the assessments contained in this report. The definitions contain both a fishing mortality rate (F) and biomass (B) component.

(Gulf of Maine) - Overfishing occurs when F exceeds F_{msy}. The best available estimate of F_{msy} is 0.23.

A stock is overfished when the total stock biomass is less than ¼B_{msy}. The best available estimate of B_{msy} is 90,300 mt (SAW-33, 2001).

(Georges Bank) - Overfishing occurs when F exceeds F_{msy}. The best available estimate of F_{msy} is 0.32.

A stock is overfished when the total stock biomass is less than ¼B_{msy}. The best available estimate of B_{msy} is 27,000 mt.

Haddock – The following overfishing definitions have been fully approved under SFA guidelines and were used to make the assessments contained in this report. The definitions contain both a fishing mortality rate (F) and biomass (B) component.

(Gulf of Maine) - Overfishing occurs when the relative exploitation index (catch/autumn biomass index) exceeds 0.29 (F_{msy} proxy).

A stock is overfished when the total stock biomass is less than the survey proxy for ½B_{msy} (4.13 kg/tow).

(Georges Bank)- Overfishing occurs when F exceeds $F_{0.1}$ (0.26).

A stock is overfished when the spawning stock biomass is less than ½B_{target} (53,000).

American Plaice – The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds $F_{0.1}$. The best available (current) estimate of $F_{0.1}$ is 0.19.

A stock is overfished when the spawning stock biomass is less than ¼B_{msy} at $F_{0.1}$. The best available estimate of $B_{threshold}$ is 6,050 mt.

Redfish - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds $F_{20\%}$. The best available estimate of $F_{20\%}$ is 0.12.

A stock is overfished when the spawning stock biomass is less than ½B_{msy}. B_{msy} cannot be estimated, however a ratio of current biomass to B_{msy} was used to determine the stock status relative to the overfishing definition (SAW-33, 2001).

Witch Flounder – The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds F_{msy}. The best available (current) estimate of F_{msy} (biomass weighted) is 0.106.

A stock is overfished when the total stock biomass is less than 42%B_{msy}. B_{msy} is estimated at 25,000 mt (SAW-19, 1999).

Yellowtail Flounder – The following overfishing definitions have been fully approved under SFA guidelines and were used to make the assessments contained in this report. The definitions contain both a fishing mortality rate (F) and biomass (B) component.

(Georges Bank) – Overfishing occurs when F exceeds F_{msy}. The best available (current) estimate of F_{msy} is 0.33 (biomass weighted, ages 1+).

A stock is overfished when the total stock biomass is less than $¼B_{msy}$. The best available (current) estimate of $¼B_{msy}$ is (10,870 mt). (TRAC, 2001).

(Southern New England) - Overfishing occurs when F exceeds F_{msy} (0.23).

A stock is overfished when the total stock biomass is less than $¼B_{msy}$ (12,800 mt).

(Cape Cod) – Overfishing occurs when F exceeds F_{msy}. The best available estimate of F_{msy} is 0.40 (biomass weighted); and 0.54 (fully recruited).

A stock is overfished when the total stock biomass is less than $½B_{msy}$. The best available estimate of B_{msy} is 6,100 mt. (SAW-28,1999).

(Middle Atlantic) - Overfishing occurs when F exceeds F_{msy}, which is defined as MSY/B_{target}. The best available estimate of F_{msy} proxy is 0.36.

A stock is overfished when the total stock biomass is less than the survey proxy for $½B_{msy}$. The best available estimate of B_{msy} proxy is 4.58 kg/tow .

White Hake – The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds F_{msy}. The best available estimate of F_{msy} is 0.29.

A stock is overfished when the total stock biomass is less than $¼B_{msy}$. The best available estimate of B_{msy} is 14,700 mt (SAW-33, 2001).

Pollock – The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds $F_{20\%}$. The best available estimate of $F_{20\%}$ (F_{msy} proxy) is 0.65.

A stock is overfished when the spawning stock biomass is less than $¼B_{msy}$. The best available estimate of B_{msy} is 26,000 mt.

Ocean Pout – The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds F_{msy} proxy. The best available estimate of the F_{msy} proxy is 0.31 catch / survey index.

A stock is overfished when the total stock biomass is less than ½B_{msy} proxy. The best available estimate of the B_{msy} proxy is 2.4 kg/tow.

Atlantic Halibut - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds $F_{0.1}$. Maximum rebuilding time is undefined for this stock. No fishing mortality is permitted (F = 0) until the stock is rebuilt (provisional control law). The best available estimate of $F_{0.1}$ is 0.06.

A stock is overfished when the total stock biomass is less than the biomass threshold of ½B_{MSY}. The best available estimate of B_{MSY} is 5,400 mt.

Windowpane Flounder – The following overfishing definitions have been fully approved under SFA guidelines and were used to make the assessments contained in this report. The definitions contain both a fishing mortality rate (F) and biomass (B) component.

(Gulf of Maine / Georges Bank) - Overfishing occurs when F exceeds F_{msy} proxy of a relative exploitation index. The best available estimate of the F_{msy} proxy is 1.11 catch / survey index.

A stock is overfished when the total stock biomass is less than ½B_{msy}. The best availalbe estimate of the B_{msy} proxy is 0.47 kg/tow.

(Southern New England / Middle Atlantic) – Overfishing occurs when F exceeds F_{msy} proxy of a relative exploitation index. The best available estimate of the F_{msy} proxy is 2.24 catch / survey index.

A stock is overfished when the total stock biomass is less than ½B_{msy} The best availalbe estimate of the B_{msy} proxy is 0.10 kg/tow.

Winter Flounder (Gulf of Maine) - The overfishing definition was disapproved under SFA guidelines. The following overfishing definition was approved under pre-SFA guidelines and was used to make the assessments contained in this report. This definition contains only a fishing morality rate (F) component.

Overfishing occurs when the fishing mortality rate exceeds the rate associated with 20% MSP by NEFMC and 40% by ASMFC.

Winter Flounder - The following overfishing definitions have been fully approved under SFA guidelines and were used to make the assessments contained in this report. The definitions contain both a fishing mortality rate (F) and biomass (B) component.

(Georges Bank) - Overfishing occurs when F exceeds F_{MSY}. Best available estimates of F_{MSY} proxy is 1.12.

A stock is overfished when the total stock biomass is less than $\frac{1}{2}B_{MSY}$. Best available estimates of B_{MSY} proxy is 2.730 (SAW-28, 1999).

(Southern New England) - Overfishing occurs when F exceeds F_{MSY}. Best available estimates of F_{MSY} is 0.37 (biomass weighted).

A stock is overfished when the total stock biomass is less than $\frac{1}{4}B_{MSY}$. Best available estimates of B_{MSY} is 27,800 mt.

Silver Hake - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

(Gulf of Maine / Northern Georges Bank, Southern Georges Bank / Middle Atlantic) - Overfishing occurs when F exceeds F_{MSY}, the proxy for which is $F_{0.1}$. The best available estimates of $F_{0.1}$ are 0.41 for Gulf of Maine / Northern Georges Bank Silver Hake, and 0.39 for Southern Georges Bank / Middle Atlantic Silver Hake.

B_{MSY} proxies are estimated at 3.31 (Northern), and 0.89 (Southern) (SAW-32, 2000).

Offshore Hake - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when the 3-year moving average weight per individual in the autumn survey falls below the 25th percentile of the average weight per individual from the autumn survey time series 1963-1997 (0.236).

A stock is overfished when the 3-year moving average of the abundance of immature fish less than 30 cm falls below the median value of the 1963-1997 autumn survey abundance of fish less than 30 cm (0.33 #/tow).

Red Hake (Gulf of Maine / Northern Georges Bank) - The following overfishing definitions have been fully approved under SFA guidelines and were used to make the assessments contained in this report. The definitions contain both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds F_{MSY}. The best available estimate of F_{MSY} is 0.65.

A stock is overfished when the biomass is less than $\frac{1}{2}B_{MSY}$ proxy. The best available estimate of B_{MSY} proxy is 1.6 kg/tow.

Red Hake (Southern Georges Bank / Middle Atlantic) - The following overfishing definition has been partially approved under SFA guidelines and was used to make the assessment contained in this report. The definition contains only a fishing mortality rate (F) component.

Overfishing is defined by a combination of the mean individual weight less than 0.12 kg and the recruitment index of fish <25 cm less than 4.72 kg/tow.

Overfished is undefined. The 2000 Report incorrectly indicated an overfished component to this stock's overfishing definition.

Atlantic Herring - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when the fishing mortality rate exceeds F_{msy}. The best available estimate of F_{msy} is 0.30.

A stock is overfished when the total stock biomass is less than $\frac{1}{2}B_{msy.}$ The best available estimate of B_{msy} is 1.07 million mt.

Monkfish - The following overfishing definitions have been fully approved under SFA guidelines and were used to make the assessments contained in this report. The definitions contain both a fishing mortality rate (F) and biomass (B) component.

Northern stock – Overfishing occurs when F exceeds $F_{threshold}$, which is the average F during 1970-1979. Current estimates place the value at 0.051.

A stock is overfished when the survey index is less than $B_{threshold}$, which is the 33rd percentile of the 1963-1994 NEFSC autumn trawl survey catch. Current estimates are 1.45 kg/tow.

Southern stock - Overfishing occurs when F exceeds $F_{threshold}$, which is the average F during 1970-1979 (0.21).

A stock is overfished when the survey index is less than $B_{threshold}$, which is the 33rd percentile of the 1963-1994 NEFSC autumn trawl survey catch. Best available estimate of $B_{threshold}$ is 0.70 kg/tow (SAW-31, 2000).

Spiny Dogfish - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definitions contain both a fishing mortality rate (F) and biomass (B) component. The biomass target was disapproved.
Overfishing occurs when F exceeds $F_{threshold}$, the mortality rate that stabilizes the population at SSB_{max} when recruitment is at 27.5 inches (70cm. The current estimate of $F_{threshold}$ is 0.11.

A stock is overfished when the biomass is less than $\frac{1}{2}SSB_{max.}$ The current estimate of $B_{threshold}$ is 100,000 mt female biomass.

Summer Flounder, Scup, and Black Sea Bass

Summer Flounder - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds the threshold of F_{max} (F_{max} is used as a proxy for F_{msy}). The best available estimate of F_{max} is 0.26.

A stock is overfished when total biomass falls below the minimum biomass threshold of $\frac{1}{2}B_{msy}$. The best available estimate of B_{msy} is 106,000 mt (SAW-31, 2000).

Scup - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds the threshold F_{max} (F_{max} is used as a proxy for F_{msy}). The best available estimate of F_{max} is 0.26.

A stock is overfished when the minimum biomass index for rebuilding is less than $B_{threshold}$, which is the maximum value of a 3-year moving average of the Northeast Fisheries Science Center's spring survey catch per tow of spawning stock biomass (SSB). The best available estimate of $B_{threshold}$ is 2.77 kg/tow, the average of 1977-1979.

Black Sea Bass - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds the threshold F_{max} (F_{max} is used as a proxy for F_{msy}). The best available estimate of F_{max} is 0.32.

A stock is overfished when the minimum biomass index for rebuilding is less than $B_{threshold}$, which is the maximum value of a 3-year moving average of the Northeast Fisheries Science Center's spring survey exploitable biomass index (fish >22 cm). The best available estimate of $B_{threshold}$ is 0.9 kg/tow.

Bluefish (except Gulf of Mexico) - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds the threshold F_{MSY}. The best available estimate of F_{MSY} is 0.4.

A stock is overfished when the minimum biomass is less than $\frac{1}{2}B_{MSY}$. The best available estimate of B_{MSY} is 107,600 mt.

Surfclams and Ocean Quahogs

Surfclam - The overfishing definition was disapproved under SFA guidelines. The following overfishing definition was approved under pre-SFA guidelines and was used to make the assessments contained in this report. This definition contains only a fishing morality rate (F) component.

The overfishing definition for surfclams is the fishing mortality rate of $F_{20\%}$ (20% of MSP). The best available estimate of $F_{20\%}$ is 0.18 (SAW-30, 2000).

Ocean Quahog – The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when the overfishing target is exceeded, which is $F_{target} = F_{0.1}$ for the exploited region and ½ the virgin biomass. The best available estimate of $F_{0.1}$ is 0.22.

A stock is overfished when the minimum biomass is less than the biomass threshold of $½B_{msy}$ or ¼ of the virgin biomass. The best available estimate of B_{msy} is 1 million mt (SAW-31, 2000).

Atlantic Mackerel, Squid, and Butterfish

***Illex* Squid** - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds the fishing mortality threshold of F_{msy}. The best available estimate of F_{msy} is 1.22.

A stock is overfished when the minimum biomass is less than $½B_{msy}$. The best available estimate of B_{msy} is 39,300 mt.

***Loligo* Squid** - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds the fishing mortality threshold of F_{max} (F_{max} is a proxy for F_{msy}). Current estimates for $F_{max} = 0.7$ and 1.2 for winter and summer cohorts, respectively.

A stock is overfished when the minimum biomass is less than the biomass threshold of $½B_{msy}$. The best available estimate of B_{msy} is 80,000 mt (SAW-19, 1999).

Atlantic Mackerel – The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when F exceeds the fishing mortality threshold of F_{msy} (0.45). To avoid low levels of

recruitment, the threshold F decreases linearly from 0.45 at 445,000 mt SSB to zero at 225,000 mt SSB ($¼B_{msy}$).

A stock is overfished when the SSB is less than 890,000 mt. The estimates of the component parts of this overfishing definition were not re-estimated from past levels and therefore remain the best available estimates (SAW-30, 2000).

Butterfish (Atlantic) – The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when the catch associated with a threshold F of F_{msy} is exceeded. F_{msy} is currently estimated at 1.01, and has not been re-estimated since the 2000 Report.

A stock is overfished when the minimum biomass is less than the biomass threshold of $½B_{msy}$. Estimates of B_{msy} are unknown.

Golden Tilefish - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing occurs when the catch associated with a threshold F of F_{msy} is exceeded. The current estimate of F_{msy} is 0.22.

A stock is overfished when the total stock biomass falls below the minimum biomass threshold ($B_{threshold}$) of $½B_{msy}$. The current estimate of $B_{threshold}$ is 4,200 mt.

Golden Crab of the South Atlantic - The following overfishing definition was partially approved under SFA guidelines and was used to make the assessments contained in this report. This definition contains only a fishing mortality rate (F) component.

Overfishing is defined as any rate of fishing mortality in excess of F_{msy} for golden crab in the South Atlantic Council's management area.

Shrimp Fishery of the South Atlantic - The following overfishing definitions were partially approved under SFA guidelines and were used to make the assessments contained in this report. For the fishing mortality rate (F) component, the pre-SFA definition was used to make the assessments.

White Shrimp – The South Atlantic white shrimp resource is overfished and overfishing occurs when the overwintering white shrimp population within a state's water declines by 80% or more following severe winter weather resulting in prolonged cold water temperatures.

Rock Shrimp – The South Atlantic rock shrimp resource is overfished and overfishing occurs when the annual landings exceed the value which is two standard deviations above mean landings for the period 1986-1994.

Brown Shrimp and **Pink Shrimp** – The South Atlantic brown and pink resources are overfished and overfishing occurs when annual landings fall below two standard deviations below mean landings for the period 1957-1993 for 3 consecutive years.

South Atlantic Snapper-Grouper - For the following overfishing definitions, the fishing mortality rate (F) component has been approved under SFA guidelines, and was used to make the assessments contained in this report. The biomass (B) component was approved under SFA guidelines for **Black Sea Bass** and **Red Porgy**. For all other stocks, Spawning Potential Ratio (SPR) was used to determine the overfished status, and was approved under pre-SFA guidelines.

Goliath Grouper (Jewfish), Nassau Grouper - Overfishing is defined as a fishing mortality rate (F) in excess of the fishing mortality rate corresponding to a 40% Static SPR.

Overfished is defined as SPR less than 40%. Based on qualitative information, it is believed that these stocks are severely overfished due to a lack of occurrence in sampling and catches (prior to moratorium).

Vermilion Snapper, Gag, Red Snapper, Speckled Hind, Snowy Grouper, Warsaw Grouper, Golden Tilefish, Yellowtail Snapper, Red Grouper, Black Grouper, Mutton Snapper, Greater Amberjack, Wreckfish, Yellowedge Grouper, Scamp, White Grunt, Gray (Mangrove) Snapper, Lane Snapper, Gray Triggerfish, Queen Triggerfish, Ocean Triggerfish, Yellow Jack, Blue Runner, Crevalle Jack, Bar Jack, Lesser Amberjack, Almaco Jack, Banded Rudderfish, Spadefish, Black Margate, Porkfish, Margate, Tomtate, Smallmouth Grunt, French Grunt, Spanish Grunt, Cottonwick, Sailors Choice, Blue Stripe Grunt, Hogfish, Puddingwife, Black Snapper, Queen Snapper, Schoolmaster, Blackfin Snapper, Cubera Snapper, Mahogany Snapper, Dog Snapper, Silk Snapper, Blueline Tilefish, Sand Tilefish, Bank Sea Bass, Rock Sea Bass, Rock Hind, Graysby, Coney, Red Hind, Misty Grouper, Yellowmouth Grouper, Tiger Grouper, Yellowfin Grouper, Sheepshead, Grass Porgy, Jolthead Porgy, Saucereye Porgy, Whitebone Porgy, Knobbed Porgy, Longspine Porgy, Scup - Overfishing is defined as a fishing mortality rate (F) in excess of the fishing mortality rate corresponding to a 30% Static SPR.

Except for black sea bass and red porgy, overfished is defined as SPR less than 30% based on pre-SFA criteria.

Red Porgy - Overfishing is defined as a fishing mortality rate (F) in excess of the fishing mortality rate corresponding to a 35% Static SPR (F=0.43).

Overfished is defined as a stock size less than the minimum stock size threshold (7.34 million pounds).

Black Sea Bass - Overfishing is defined as a fishing mortality rate (F) in excess of the fishing mortality rate corresponding to a 30% Static SPR (0.72).

Overfished is defined as a stock size less than the minimum stock size threshold (3.72 million pounds).

Atlantic Coast Red Drum - For the following overfishing definition, the fishing mortality rate (F) component has been approved under SFA guidelines, and was used to make the assessment contained in this report. Spawning Potential Ratio (SPR) was used to determine the overfished status, and was approved under pre-SFA guidelines.

Overfishing is defined as a fishing mortality rate (F) in excess of the fishing mortality rate corresponding to a 30% Static SPR.

Overfished is defined as SPR less than 30%.

Coral, Coral Reefs, and Live / Hard Bottom Habitats of the South Atlantic Region - The following overfishing definition was approved under pre-SFA guidelines and was used to make the assessments contained in this report. This definition contains only a fishing mortality rate (F) component.

Fire Corals, Hydrocorals, Octocorals, Stony Corals, Black Corals - Overfishing is defined as an annual level of harvest that exceeds optimum yield (OY). OY for coral reefs, stony corals, hydrocorals, black corals, seafans, and live rock is zero, except as may be authorized for scientific and educational purposes. Harvest of allowable octocorals in the EEZ is specified by the South Atlantic Council each year.

Overfished is not defined.

Stone Crab Fishery of the Gulf of Mexico - For the following overfishing definition, the fishing mortality rate (F) component has been approved under SFA guidelines, and was used to make the assessment contained in this report. The pre-SFA definition was used to make the assessment of overfished status.

Overfishing occurs and a stock is overfished when the realized egg production per recruit is reduced below 70% of potential production. This will be avoided when there is a minimum claw length (length of prodopus) that assures survival of the crabs to achieve 70% egg production per recruit potential.

Shrimp Fishery of the Gulf of Mexico - For the following overfishing definitions, the biomass (B) component has been approved for **Brown Shrimp**, **Pink Shrimp**, and **White Shrimp** under SFA guidelines, and was used to make the assessments contained in this report. For **Royal Red Shrimp**, there is no biomass component of the overfishing definition to make an assessment. For the fishing mortality rate (F) component, the pre-SFA definitions were used to make the assessments for all of the shrimp.

Brown Shrimp - Overfishing is occurring and the stock is overfished when the parent stock levels are reduced below 125 million shrimp (MSST). This value is slightly lower than the 1983 level of parent stock, which is the lowest observed value since 1960. Parent stock is defined for brown shrimp as the number of age 7+ (months) shrimp during the November through February period.

Pink Shrimp - Overfishing is occurring and the stock is overfished when parent stock levels are reduced below 100 million shrimp (MSST). Parent stock is defined for pink shrimp as the number of 5+ (months) shrimp during the July through June period. Pink shrimp in the western U.S. Gulf were not included in this definition because mixed catches of brown and pink shrimp are not separated and are landed, sold, and statistically treated as brown shrimp.

White Shrimp - Overfishing is occurring and the stock is overfished when parent stock levels are reduced below 330 million shrimp (MSST). Parent stock is defined for pink shrimp as the number of age 7+ (months) shrimp during the May through August period.

Royal Red Shrimp - Overfishing is occurring and the stock is overfished when landings exceed optimum yield (OY). OY is set at MSY (maximum sustainable yield), which was estimated to be 392,000 pounds of tails over 1,290 days fished. Royal red shrimp differ from penaeid shrimp in that they are not estuarine dependent but exist in a relatively constant environment in the deeper waters of the Gulf of Mexico (100 to 300 fathoms). Thus, they conform more closely to a classical Schaefer-type fishery.

Overfished is undefined.

Coral and Coral Reefs of the Gulf of Mexico - The following overfishing definition was approved under pre-SFA guidelines and was used to make the assessments contained in this report. This definition contains only a fishing mortality rate (F) component.

Fire Corals, Hydrocorals, Octocorals, Stony Corals, Black Corals - Overfishing is defined as an annual level of harvest that exceeds optimum yield (OY). OY for coral reefs, stony corals, hydrocorals, black corals, seafans, and live rock is zero, except as may be authorized for scientific and educational purposes. Harvest of allowable octocorals in the EEZ is not to exceed 50,000 colonies per year (Gulf and South Atlantic EEZ combined).

Overfished is undefined.

Spiny Lobster Fishery of the South Atlantic and Gulf of Mexico - For the following overfishing definition, the fishing mortality rate (F) component has been approved under SFA guidelines, and was used to make the assessment contained in this report. Transitional Spawning Potential Ratio (SPR) was used to determine the overfished status, and was approved under pre-SFA guidelines.

Spiny Lobster - Overfishing is defined as a fishing mortality rate (F) in excess of the fishing mortality rate corresponding to a 20% SPR.

The stock is overfished when the SPR is less than 20%.

Slipper Lobster - No overfishing definition exists in the FMP.

Coastal Migratory Pelagics of the South Atlantic and Gulf of Mexico - The overfishing definitions for the following South Atlantic stocks have been fully approved under SFA guidelines, and were used to make the assessments contained in this report. The definitions contain both a fishing mortality rate (F) and biomass (B) component.

Atlantic group King Mackerel and Atlantic group Spanish Mackerel - Overfishing occurs when the fishing mortality rate (F) is in excess of the F corresponding to a 30% Static SPR.

A stock is overfished when the stock size is less than the minimum stock size threshold (MSST).

For the following stocks, the fishing mortality rate (F) component of the overfishing definition has been approved under SFA guidelines, and was used to make the assessments contained in this report. Transitional Spawning Potential Ratio (SPR) was used to determine the overfished status, and was approved under pre-SFA guidelines.

Gulf group King Mackerel, Gulf group Spanish Mackerel, and Dolphin - Overfishing occurs when the fishing mortality rate (F) is in excess of the F corresponding to a 30% Static SPR.

A stock is overfished when the transitional SPR is less than 20%.

Cobia, Cero, Little Tunny, Bluefish (Gulf of Mexico only) - Overfishing occurs when the fishing mortality rate (F) is in excess of the F corresponding to a 30% Static SPR.

A stock is overfished when the transitional SPR is less than 20%.

Reef Fish of the Gulf of Mexico - For all of the following stocks except **Red Snapper**, the fishing mortality rate (F) component of the overfishing definition has been approved under SFA guidelines, and was used to make the assessments contained in this report. For the fishing mortality rate (F) component for **Red Snapper**, the pre-SFA definition was used to make the assessments. Transitional Spawning Potential Ratio (SPR) was used to determine the overfished status for all stocks except **Red Grouper**, and was approved under pre-SFA guidelines. For **Red Grouper**, the overfished determination is based on the biomass-based thresholds contained in the 1999 and 2000 stock assessments documents.

Red Snapper - Overfishing occurs when the fishing mortality rates exceeds that associated with a 20% static SPR.

The stock is overfished when the transitional SPR is less than 20%.

Red Grouper - The maximum fishing mortality threshold is the rate corresponding to a 30% static SPR. Overfishing occurs when the fishing mortality rates exceeds that associated with a 30% static SPR.

The overfished determination is based on the biomass-based thresholds contained in the 1999 and 2000 stock assessments documents.

Nassau Grouper, Goliath Grouper (Jewfish) - The maximum fishing mortality threshold is the rate corresponding to a 40% static SPR. Overfishing occurs when the fishing mortality rates exceeds that associated with a 40% static SPR.

A stock is overfished when the transitional SPR is less than 20%. Qualitative information suggests that these stocks are severely overfished due to a lack of occurrence in sampling and catches (prior to moratorium).

Greater Amberjack, Gag, Vermilion Snapper, Gray Triggerfish, Lesser Amberjack, Almaco Jack, Banded Rudderfish, Queen Snapper, Mutton Snapper, Schoolmaster, Blackfin Snapper, Cubera Snapper, Gray (Mangrove) Snapper, Dog Snapper, Mahogany Snapper, Lane Snapper, Silk Snapper, Yellowtail Snapper, Wenchman, Goldface Tilefish, Blackline Tilefish, Anchor Tilefish, Blueline Tilefish, Tilefish, Rock Hind, Speckled Hind, Yellowedge Grouper, Red Hind, Misty Grouper, Warsaw Grouper, Snowy Grouper, Black Grouper, Yellowmouth Grouper, Scamp, Yellowfin Grouper, Hogfish, Dwarf Sand Perch, Sand Perch - The maximum fishing mortality threshold is the rate corresponding to a 30% static SPR. Overfishing occurs when the fishing mortality rates exceeds that associated with a 30% static SPR.

A stock is overfished when the transitional SPR is less than 20%.

Red Drum (Gulf of Mexico) - For the following overfishing definition, the fishing mortality rate (F) component has been approved under SFA guidelines, and was used to make the assessment contained in this report. Transitional Spawning Potential Ratio (SPR) was used to determine the overfished status, and was approved under pre-SFA guidelines.

The maximum fishing mortality threshold is the rate corresponding to a 30% static SPR. Overfishing occurs when the fishing mortality rates exceeds that associated with a 30% static SPR.

A stock is overfished when the transitional SPR is less than 20%.

Spiny Lobster (Caribbean) - The following overfishing definition was approved under pre-SFA guidelines and was used to make the assessments contained in this report. This definition contains both a fishing mortality rate (F) and transitional Spawning Potential Ratio (SPR) component.

When a spiny lobster stock or stock complex is overfished, overfishing is defined as the harvesting rate that is not consistent with a program that has been established to rebuild the stock or stock complex to the 20% SPR. When a spiny lobster stock or stock complex is not overfished, overfishing is defined as a harvesting rate that, if continued, would lead to a state that would not allow harvest at OY on a continuing basis. The SPR for spiny lobsters is measured in terms of eggs per recruit. For monitoring the SPR, the method described by Gregory et al. (1982) will be used to compare female fecundity by length class within fished areas to that in unfished areas.

A spiny lobster stock or stock complex is overfished when it is below the level of 20% of the Spawning Potential Ratio (SPR).

Reef Fish Fishery of Puerto Rico and the U.S. Virgin Islands - The following overfishing definition was approved under pre-SFA guidelines and was used to make the assessments contained in this report. This definition contains both a fishing mortality rate (F) and transitional Spawning Potential Ratio (SPR) component.

Goliath Grouper (Jewfish), **Nassau Grouper** - Overfishing occurs when the fishing mortality rates exceeds that corresponding to a 20% SPR level.

A stock is overfished when the transitional SPR is less than 20%. Qualitative information suggests that these stocks are severely overfished due to a lack of occurrence in sampling and catches (prior to moratorium).

Ocean Surgeonfish, Doctorfish, Blue Tang, Frogfish, Flamefish, Conchfish, Trumpetfish, Scrawled Filefish, Queen Triggerfish, Whitespotted Filefish, Ocean Triggerfish, Black Durgon, Sargassum Triggerfish, Redlip Blenny, Peacock Flounder, Yellow Jack, Blue Runner, Horse-eye Jack, Black Jack, Bar Jack, Greater Amberjack, Almaco Jack, Longsnout Butterflyfish, Foureye Butterflyfish, Spotfin Butterflyfish, Banded Butterflyfish, Redspotted Hawkfish, Flying Gurnard, Atlantic Spadefish, Neon Goby, Rusty Goby, Royal Gramma, Porkfish, Margate, Tomtate, French Grunt, White Grunt, Bluestriped Grunt, Squirrelfish, Longspine Squirrelfish, Blackbar Soldierfish, Cardinal Soldierfish, Spanish Hogfish, Creole Wrasse, Yellowcheek Wrasse, Yellowhead Wrasse, Clown Wrasse, Puddingwife, Pearly Razorfish, Green Razorfish, Hogfish, Bluehead Wrasse, Black Snapper, Queen Snapper, Mutton Snapper, Schoolmaster, Blackfin Snapper, Gray Snapper, Dog Snapper, Mahogany Snapper, Lane Snapper, Silk Snapper, Yellowtail Snapper, Wenchman, Vermilion Snapper, Blackline Tilefish, Sand Tilefish, Yellow Goatfish, Spotted Goatfish, Chain Moray, Green Moray, Goldentail Moray, Batfish, Goldspotted Eel, Yellowhead Jawfish, Dusky Jawfish, Spotted Trunkfish, Honeycomb Cowfish, Scrawled Cowfish, Trunkfish, Smooth Trunkfish, Cherubfish, Queen Angelfish, Rock Beauty, Gray Angelfish, French Angelfish, Sergeant Major, Blue Chromis, Sunshinefish, Yellowtail Damselfish, Dusky Damselfish, Beaugregory, Bicolor Damselfish, Threespot Damselfish, Bigeye, Glasseye Snapper, Midnight Parrotfish, Blue Parrotfish, Striped Parrotfish, Rainbow Parrotfish, Princess Parrotfish, Queen Parrotfish, Redband Parrotfish, Redtail Parrotfish, Redfin Parrotfish, Stoplight Parrotfish, High-hat, Jackknife-fish, Spotted Drum, Scorpionfishes, Rock Hind, Graysby, Yellowedge Grouper, Coney, Red Hind, Red Grouper, Misty Grouper, Butter Hamlet, Swissguard Basslet, Yellowfin Grouper, Tiger Grouper, Creole-fish, Greater Soapfish, Orangeback Bass, Lantern Bass, Tobaccofish, Harlequin Bass, Chalk Bass, Caribbean Tonguefish, Sea Bream, Jolthead Porgy, Sheepshead Porgy, Pluma, Seahorses, Pipefishes, Sand Diver, Sharpnose Puffer, Porcupinefish - Overfishing occurs when the fishing mortality rates exceeds that corresponding to a 20% SPR level.

A stock is overfished when the transitional SPR is less than 20%.

Queen Conch Resources of Puerto Rico and the U.S. Virgin Islands - The following overfishing definition was approved under pre-SFA guidelines and was used to make the assessments contained in this report. This definition contains both a fishing mortality rate (F) and biomass (B) component.

Queen Conch - When a queen conch stock is overfished, overfishing is defined as harvesting at a rate that is not consistent with a program that has been established to rebuild the stock to the 20% SSBR level. When a queen conch stock is not overfished, overfishing is defined as a harvesting rate that, if continued, would lead to a state of the stock or stock complex that would not at least allow a harvest of OY on a continuing basis.

A queen conch stock is overfished when it is below the level of 20% of the spawning stock biomass per recruit (SSBR) that would occur in the absence of fishing.

Atlantic Triton's Trumpet, Cameo Helmet, Caribbean Helmet, Caribbean Vase, Flame Helmet, Green Star Shell, Hawkwing Conch, Milk Conch, Roostertail Conch, True Tulip, West Indian

Fighting Conch, Whelk (West Indian Top Shell) - No overfishing definition exists in the FMP.

Corals and Reef Associated Invertebrates of Puerto Rico and the U.S. Virgin Islands -The following overfishing definition was approved under pre-SFA guidelines and was used to make the assessments contained in this report. This definition contains only a fishing mortality rate (F) component.

Hydrocorals, Soft Corals, Gorgonian Corals, Hard Corals, Black Corals, False Corals, Sponges, Hydroids, Anemones, Colonial Anemones, Annelid Worms, other Gastropods, Bivalves, Cephalopods, Crustaceans, Bryozoans, Feather Stars, Sea Stars, Brittle and Basket Stars, Sea Urchins, Sea Cucumbers, Tunicates - Overfishing is defined as an annual level of harvest that exceeds OY. OY for stony corals, octocorals, live-rock and seagrasses is set at zero, except as may be authorized for scientific research, education and restoration purposes.

Green Algae, Red Algae, Seagrasses - No overfishing definition exists in the FMP.

Washington, Oregon, and California Salmon - The following overfishing definition was approved under post-SFA guidelines and was used to make the assessments contained in this report. This definition was used to make determinations for both the fishing mortality rate and stock level.

CALIFORNIA CENTRAL VALLEY CHINOOK (includes Sacramento River Fall, Sacramento River Spring, and Sacramento River Winter), NORTHERN CALIFORNIA COAST CHINOOK (includes Eel, Mattole, Mad, and Smith Rivers, Klamath River Fall, and Klamath River Spring), OREGON COAST CHINOOK (includes Southern Oregon, and Central and Northern Oregon), COLUMBIA RIVER BASIN CHINOOK (includes North Lewis River Fall, Lower River Hatchery Fall, Lower River Hatchery Spring, Upper Willamette Spring, Mid-River Bright Hatchery (Fall), Spring Creek Hatchery (Fall), Klickitat, Warm Springs, John Day, and Yakima Rivers (Spring), Snake River Fall, Snake River Spring / Summer, Upper River Bright (Fall), Upper River Summer, and Upper River Spring), WASHINGTON COAST CHINOOK (includes Willapa Bay Fall (natural), Willapa Bay Fall (hatchery), Grays Harbor Fall, Grays Harbor Spring, Quinault Fall, Queets Fall, Queets Spring / Summer, Hoh Fall, Hoh Spring / Summer, Quillayute Fall, Quillayute Spring / Summer, and Hoko Summer / Fall), PUGET SOUND CHINOOK [includes Eastern Strait of Juan de Fuca Summer / Fall, Skokomish Summer / Fall (Hood Canal), Nooksack Spring (early), Skagit Summer / Fall, Skagit Spring, Stillaguamish Summer / Fall, Snohomish Summer / Fall, Cedar River Summer / Fall (Lake Washington), White River Spring, Green River Summer / Fall, and Nisqually River Summer / Fall (South Puget Sound)], SOUTHERN BRITISH COLUMBIA CHINOOK [includes Coastal Stocks, and Fraser River), OREGON PRODUCTION INDEX AREA COHO (includes Central California Coast, Northern California, Oregon Coastal Natural, Columbia River Late (Hatchery), Columbia River Early (Hatchery), and Columbia River (Natural)], WASHINGTON COASTAL COHO [includes Willapa Bay (Hatchery), Grays Harbor, Quinault (Hatchery), Queets, Hoh, Quillayute Fall, Quillayute Summer (Hatchery), and Western Strait of Juan deFuca), PUGET SOUND COHO (includes Eastern Strait of Juan de Fuca, Hood Canal, Skagit, Stillaguamish, Snohomish, South Puget Sound (Hatchery)], SOUTHERN BRITISH COLUMBIA COAST COHO (includes Coastal Stocks, and Fraser River) and PINK (ODD-NUMBERED YEARS) (includes PUGET SOUND, and Fraser River) - With NMFS approval of Amendment 14 to the Pacific Coast Salmon Plan (Salmon FMP) on September 27, 2000, the Council's criteria for an overfishing concern are met if, in three consecutive years, the post-season estimates

indicate a natural stock has fallen short of its conservation objective (MSY, maximum sustainable production (MSP), or spawner floor as noted for some harvest rate objectives) as listed in Table 3-1 of the Salmon FMP. It is possible that this situation could represent normal variation, as has been seen in the past for several previously referenced salmon stocks which were reviewed under the Council's former overfishing definition. However, the occurrence of three consecutive years of reduced stock size or spawner escapements, depending on the magnitude of the short-fall, could signal the beginning of a critical downward trend which may result in fishing that jeopardizes the capacity of the stock to produce MSY over the long term if appropriate actions are not taken to ensure the automatic rebuilding feature of the conservation objectives is achieved.

Chinook or king salmon (Oncorhynchus tshawytscha) and coho or silver salmon (O. kisutch) are the main species caught in Council-managed ocean salmon fisheries. In odd-numbered years, catches of pink salmon (O. gorbuscha) can also be significant, primarily off Washington and Oregon. Therefore, while all species of salmon fall under the jurisdiction of this plan, it currently contains conservation objectives only for chinook, coho, pink (odd-numbered years only), and any salmon species listed under the Endangered Species Act (ESA) that is measurably impacted by Council fisheries. To the extent practicable, the Council has partitioned this coastwide aggregate of chinook, coho and pink salmon into various stock components with specific conservation objectives. A detailed listing of the individual stocks or stock complexes managed under the Salmon FMP, along with pertinent stock information and conservation objectives, is provided in Chapter 3 of the Salmon FMP.

The Salmon FMP contains no fishery management objectives for even-numbered year pink salmon, chum (O. keta), sockeye (O. nerka), steelhead (O. mykiss), or sea-run cutthroat (O. clarki). The Council does not manage fisheries for these species and incidental catches are inconsequential (low hundreds of fish each year) to very rare.

To achieve optimum yield, prevent overfishing, and assure rebuilding of salmon stocks whose abundance has been depressed to an overfished level, the Salmon FMP establishes, to the extent practicable, conservation objectives to perpetuate the coastwide aggregate of salmon stocks covered by the Salmon FMP. The Council's stock conservation objectives (to be achieved annually) and other pertinent stock management information are contained in Table 3-1. Specific objectives are listed for natural and hatchery stocks that are part of the Council's preseason fishery option development process, including all stocks listed under the federal ESA. The objectives may be applicable to a single stock or a complex of interrelated stocks (those sharing similarities in life-history traits, geographic distribution, habitat preferences and genetic characteristics). Stocks that are not included in the preseason analyses may lack specific conservation objectives because the stock is not significantly impacted by ocean fisheries or insufficient management information is available from which to assess ocean fishery impacts directly. In the latter case, the conservation objective for a managed stock may serve to provide for the conservation of a closely related stock unless, or until, more specific management information can be developed.

The Council's conservation objectives for natural stocks may (1) be based on estimates for achieving MSY, an MSY proxy, or MSP, or (2) represent special data gathering or rebuilding strategies to approach MSY and to eventually develop MSY or MSP objectives. The objectives have generally been developed through extensive analysis by the fishery management entities with direct management authority for the stock, or through joint efforts coordinated through the Council, or with other state, tribal or federal entities. Most of the objectives for stocks north of Cape Falcon, OR, have been included in U.S. District Court orders. Under those orders for Washington coastal and Puget Sound stocks (U.S. v. Washington, 626 F. Supp. 1405 [1985] and Hoh v. Baldrige No. 81-742 [R] C), the treaty tribes and Washington

Department of Fish and Wildlife may agree to annual spawner targets that differ from the MSP or MSY objectives. Details of the conservation objectives are available in PFMC (1984), in individual amendment documents, and as referenced in Table 3-1.

The Salmon FMP contains three exceptions to the application of overfishing criteria and subsequent Council actions for stocks or stock complexes with conservation objectives in Table 3-1: (1) hatchery stocks, (2) stocks for which Council management actions have inconsequential impacts, and (3) stocks listed under the Endangered Species Act (ESA).

Salmon stocks important to ocean fisheries and comprised exclusively of hatchery production generally have conservation objectives expressed as an egg-take or the number of spawners returning to the hatchery rack to meet program objectives. The Salmon FMP recognizes these objectives and strives to meet them. However, these artificially produced stocks generally do not need the protection of overfishing criteria and special Council rebuilding programs to maintain long-term production. Because hatchery stocks can generally sustain significantly higher harvest exploitation rates than natural stocks, ocean fisheries rarely present a threat to their long-term survival. Therefore, hatchery stocks that meet this criteria are the first exception to the application of overfishing criteria.

Several natural stock components identified within the Salmon FMP are subject to minimal harvest impacts in Council fisheries because of migration timing and/or distribution and therefore are exceptions to the application of overfishing criteria. As a result, the Council's ability to affect the overall trend in the abundance of these components through harvest restrictions is limited. Components in this second exception are identified by a cumulative adult equivalent exploitation rate of less than 5% in ocean fisheries under Council jurisdiction during base periods utilized by the fishery regulation assessment models (1979-1982 for chinook and 1979-1981 for coho).

The Council regards stocks listed as endangered or threatened under the ESA as a third exception to the application of overfishing criteria of the Magnuson-Stevens Act. The ESA requires federal agencies whose actions may jeopardize listed salmon to consult with NMFS. Because NMFS implements ocean harvest regulations, it is both the action and consulting agency for actions taken under the Salmon FMP. To ensure there is no jeopardy, NMFS conducts internal consultations with respect to the effects of ocean harvest on listed salmon. The Council implements NMFS' guidance as necessary to avoid jeopardy, as well as in recovery plans approved by NMFS. As a result of NMFS' consultation, an incidental take statement may be issued which authorizes take of listed stocks under the FMP that would otherwise be prohibited under the ESA. The Council believes that the requirements of the ESA are sufficient to meet the intent of the Magnuson-Stevens Act overfishing provisions. Those provisions are structured to maintain or rebuild stocks to levels at or above MSY and require the Council to identify and develop rebuilding plans for overfished stocks.

OTHER SALMONIDS (includes Sockeye Salmon, Chum Salmon, Pink Salmon (even-numbered years), and Steelhead) - Stocks without specified goals in the FMP are also provided significant protection against overfishing because the Council bases its management on the stock that is first reduced to its annual specified goal level by the fisheries. Such a stock could be the weakest stock or an abundant stock that is heavily impacted by ocean salmon fisheries.

Coastal Pelagics Species - The following overfishing definitions have been fully approved under SFA guidelines and were used to make the assessments contained in this report. For Pacific (Chub) Mackerel

and Pacific Sardine, the definition contains both a fishing mortality rate (F) and biomass (B) component. For Jack Mackerel and Northern Anchovy (Central subpopulation), the overfishing definition contains only a fishing mortality rate (F) component. There are no overfishing definitions for Northern Anchovy (Northern subpopulation) and Market Squid.

Pacific (Chub) Mackerel, Pacific Sardine - In operational terms, overfishing occurs whenever catch exceeds ABC, which is the annual value of the MSY control rule adopted for Pacific mackerel and Pacific sardine, which are actively managed species under the Coastal Pelagic Species FMP.

A stock is overfished when the biomass level is low enough to jeopardize the capacity of the stock to produce MSY on a continuing basis. For Pacific (Chub) Mackerel, the stock is overfished if the stock biomass is 18,200 mt or less. For Pacific Sardine, the stock is overfished if the 1+ stock biomass on July 1 is 50,000 mt or less.

Jack Mackerel, Northern Anchovy (Central subpopulation) - In operational terms, overfishing occurs whenever catch exceeds ABC, which, based on the default MSY control rule used for monitored species, is set at 25% of estimated MSY.

There is no threshold level of stock biomass defining "overfished."

Northern Anchovy (Northern subpopulation), Market Squid - No overfishing definition exists in the FMP.

Washington, Oregon, and California Groundfish - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Lingcod, Pacific Ocean Perch, Bocaccio, Canary Rockfish, Cowcod, Darkblotched Rockfish, Widow Rockfish, Yelloweye Rockfish, Bank Rockfish, Shortspine Thornyhead, Longspine Thornyhead, Yellowtail Rockfish, Pacific Whiting, Sablefish, Dover Sole, English Sole, Petrale Sole, Chilipepper Rockfish, Shortbelly Rockfish, Arrowtooth Flounder, Black Rockfish (North), Silvergrey Rockfish, Pacific Cod, Butter Sole, Curlfin Sole, Flathead Sole, Pacific Sanddab, Rex Sole, Rock Sole, Sand Sole, Starry Flounder, Aurora Rockfish, Black-and-Yellow Rockfish, Blackgill Rockfish, Blue Rockfish, Bronzespotted Rockfish, Brown Rockfish, Calico Rockfish, China Rockfish, Copper Rockfish, Dusty Rockfish, Flag Rockfish, Gopher Rockfish, Grass Rockfish, Greenblotched Rockfish, Greenspotted Rockfish, Greenstriped Rockfish, Harlequin Rockfish, Honeycomb Rockfish, Kelp Rockfish, Mexican Rockfish, Olive Rockfish, Pink Rockfish, Quillback Rockfish, Redbanded Rockfish, Redstripe Rockfish, Rosethorn Rockfish, Rosy Rockfish, Rougheye Rockfish, Sharpchin Rockfish, Shortraker Rockfish, Speckled Rockfish, Splitnose Rockfish, Squarespot Rockfish, Starry Rockfish, Stripetail Rockfish, Tiger Rockfish, Vermilion Rockfish, Yellowmouth Rockfish, Leopard Shark, Soupfin Shark, Spiny Dogfish, Big Skate, California Skate, Longnose Skate, Ratfish, Finescale Codling, Pacific Rattail, Cabezon, Kelp Greenling, California Scorpionfish, Treefish – Overfishing occurs when the catch exceeds the fishing mortality rate needed to produce the maximum sustainable yield (F_{msy}). For flatfish and whiting $F_{40\%}$, for rockfish (including thornyheads) $F_{50\%}$, and for other groundfish such as sablefish and lingcod $F_{45\%}$.

A stock is overfished if its current biomass is less than 25% of the unfished biomass level or if the current biomass is less than 50% of the biomass that wold produce the maximum sustainable yield (MSY).

Overfishing and overfished parameters cannot be estimated for all species because of the wide range of knowledge available for the species managed under the PCGFMP. Three categories of species are identified. The first includes the few species for which a quantitative stock assessment can be conducted on the basis of catch-at-age or other data. The second category includes a large number of species for which some biological indicators are available, but a quantitative analysis cannot be completed. The third category includes minor species that are caught, but for which there is, at best, only partial information on landed biomass.

Crustaceans of the Western Pacific - The overfishing definitions were disapproved under SFA guidelines. The following overfishing definitions were approved under pre-SFA guidelines and were used to make the assessments contained in this report. These definitions contain both a fishing mortality rate (F) and biomass (B) component.

Spiny Lobster - Lobster stocks shall be deemed overfished with regard to recruitment when the spawning potential ratio (measured for a specific area) is 0.2 or below.

Overfishing is currently not defined (fishing mortality is set equal to zero).

Slipper Lobster - Lobster stocks shall be deemed overfished with regard to recruitment when the spawning potential ratio (measured for a specific area) is 0.2 or below.

Overfishing is currently not defined (fishing mortality is set equal to zero).

Kona Crab - No overfishing definition exists in the FMP.

Precious Corals of the Western Pacific - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Pink Corals, Gold Corals, Bamboo Corals, Black Corals – Overfishing is defined as a fishing mortality rate that exceeds the maximum fishing mortality rate threshold (F = 0.066).

A stock is overfished when the total spawning biomass is less than or equal to 20% of its unfished condition (SPR$\leq$20%), based on cohort analysis of the pink coral.

Bottomfish and Seamount Groundfish of the Western Pacific - The overfishing definitions was disapproved under SFA guidelines. The following overfishing definition was approved under pre-SFA guidelines and were used to make the assessments contained in this report. These definitions contain only a biomass (B) component.

Pelagic Armorhead, Seabass (Main Hawaiian Islands), Squirrelfish Snapper (Northwest and Main Hawaiian Islands), Longtail Snapper (Northwest and Main Hawaiian Islands), Silverjaw Jobfish, Gray Jobfish, Bluestripe Snapper, Yellowtail Snapper, Pink Snapper, Yelloweye Snapper, Snapper Pristipomoides sieboldii, Snapper Pristipomoides zonatus, Giant Trevally, Black Jack, Thick Lipped Trevally, Amberjack, Blacktip Grouper, Seabass (Northwest Hawaiian Islands), Lunartail Grouper, Ambon Emperor, Redgill Emperor, Alfonsin, Ratfish - A bottomfish species is recruitment overfished when the Spawning Potential Ratio (i.e., the ratio of the spawning stock biomass per recruit at the current level of fishing ($SSBR_f$) to the spawning stock biomass per recruit that would occur in the absence of fishing ($SSBR_u$)), is equal to or less than .20.

Pelagic Fisheries of the Western Pacific - The overfishing definitions were disapproved under SFA guidelines. The following overfishing definitions were approved under pre-SFA guidelines and were used to make the assessments contained in this report. These definitions contain only a biomass (B) component.

Yellowfin Tuna (Central Western Pacific), Albacore (South Pacific), Albacore (North Pacific), Yellowfin Tuna (Eastern Tropical Pacific), Skipjack Tuna (Central Western Pacific), Skipjack Tuna (Eastern Tropical Pacific), Striped Marlin, Black Marlin, Bigeye Tuna (Pacific), other Tuna relatives: Auxis spp., Scomber spp., Allothunnus spp., Swordfish (Pacific), Pomfret, Sailfish (Pacific), Shortbill Spearfish (Pacific), Wahoo (Pacific), Mahimahi (Pacific), Blue Marlin (Pacific), Opah, Oilfish, Escolar - A stock is overfished when its spawning potential ratio (SPR) is equal to or less than 0.20. SPR may be estimated in several ways, using estimates of spawning stock biomass, spawning stock biomass per recruit, spawning stock catch per unit of effort, and exploitable stock biomass. The common element for all calculations is the attempt to assess the status of current spawning potential against the spawning potential of an unfished population. The use of a specific measure will depend on the availability of data for the stock and fisheries involved.

Pelagic Sharks - A stock is overfished when its spawning potential ratio (SPR) is equal to or less than 0.35. SPR may be estimated in several ways, using estimates of spawning stock biomass, spawning stock biomass per recruit, spawning stock catch per unit of effort, and exploitable stock biomass. The common element for all calculations is the attempt to assess the status of current spawning potential against the spawning potential of an unfished population. The use of a specific measure will depend on the availability of data for the stock and fisheries involved.

Gulf of Alaska Groundfish - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Western / Central Walleye Pollock, Pacific Cod, Sablefish, Shortspine Thornyhead, Arrowtooth Flounder, Western Pacific Ocean Perch, Central Pacific Ocean Perch, Eastern Pacific Ocean Perch, Northern Rockfish, Eastern Walleye Pollock, Atka Mackerel, Alaska Plaice, Butter Sole, Deepsea Sole, Dover Sole, English Sole, Flathead Sole, Greenland Turbot, Rex Sole, Northern Rock Sole, Southern Rock Sole, Sand Sole, Starry Flounder, Yellowfin Sole, Dusky Rockfish, Yelloweye Rockfish, Aurora Rockfish, Blackgill Rockfish, Bocaccio, Chilipepper, Darkblotched Rockfish, Greenstriped Rockfish, Harlequin Rockfish, Pygmy Rockfish, Redbanded Rockfish, Redstripe Rockfish, Rougheye Rockfish, Sharpchin Rockfish, Shortbelly Rockfish, Shortraker Rockfish, Silvergrey Rockfish, Splitnose Rockfish, Stripetail Rockfish, Vermilion Rockfish, Yellowmouth

Rockfish, C-O Sole, Curlfin Sole, Hybrid Sole, Longhead Dab, Pacific Sanddab, Petrale Sole, Roughscale Sole, Slender Sole, Black Rockfish, Blue Rockfish, Widow Rockfish, Yellowtail Rockfish, Canary Rockfish, China Rockfish, Copper Rockfish, Quillback Rockfish, Rosethorn Rockfish, Tiger Rockfish, Broad Banded Thornyhead, Longspine Thornyhead, Blue Shark, Brown Cat Shark, Pacific Sleeper Shark, Salmon Shark, Sixgill Shark, Spiny Dogfish Shark, Alaska Skate, Aleutian Skate, Bering Skate, Big Skate, Black Skate, Commander Skate, Longnose Skate, Mud Skate, Whiteblotched Skate, Armorhead Sculpin, Bigmouth Sculpin, Blackfin Sculpin, Dusky Sculpin, Great Sculpin, Red Irish Lord, Ribbed Sculpin, Roughspine Sculpin, Spinyhead Sculpin, Tadpole Sculpin, Thorny Sculpin, Yellow Irish Lord, Octopus Octopus dofleini, Octopus Octopus leioderma, Octopus Opisthoteuthis california, Squid Berryteuthis magister, Squid Gonatopsis borealis, Squid Gonatopsis makko, Squid Gonatus sp., Squid Loligo opalescens, Squid Moroteuthis robusta, Squid Onychoteuthis borealijaponicus - Overfishing is defined as any rate of fishing in excess of the maximum fishing mortality threshold (MFMT). The catch corresponding to fishing at a rate equal to the MFMT is referred to as the "overfishing level" (OFL). This MFMT is prescribed through a set of six tiers [which are listed in Appendix 5] in descending order of preference, corresponding to descending order of information availability. The SSC will have final authority for determining whether a given item of information is "reliable" for the purpose of this definition, and may use either objective or subjective criteria in making such determinations. For tier 1, a "pdf" refers to a probability density function. For tiers 1-2, if a reliable pdf of B_{MSY} is available, the preferred point estimate of B_{MSY} is the geometric mean of its pdf. For tiers 1-5, if a reliable pdf of B is available, the preferred point estimate is the geometric mean of its pdf. For tiers 1-3, the coefficient α is set at a default value of 0.05, with the understanding that the SSC may establish a different value for a specific stock or stock complex as merited by the best available scientific information. For tiers (2-4), a designation of the form "$F_{X\%}$" refers to the F associated with an equilibrium level of spawning per recruit (SPR) equal to X% of the equilibrium level of spawning per recruit in the absence of any fishing. If reliable information sufficient to characterize the entire maturity schedule of a species is not available, the SSC may choose to view SPR calculations based on a knife-edge maturity assumption as reliable. For tier 3, the term $B_{40\%}$ refers to the long-term average biomass that would be expected under average recruitment and $F=F_{40\%}$.

A stock is overfished when it falls below its minimum stock size threshold (MSST), defined as whichever of the following is greater: ½ the MSY stock size, or the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years if the stock were exploited at the MFMT. The MSY level is interpreted as B_{MSY} in Tiers 1-2 and $B_{35\%}$ in Tier 3. No MSY level, and therefore no MSST, can be specified for Tiers 4-6.

Alaska Salmon - For the following overfishing definitions, the fishing mortality rate (F) component has been approved under SFA guidelines, and was used to make the assessments contained in this report. The biomass (B) component was approved under pre-SFA guidelines.

Salmon Fisheries in the EEZ off the Coast of Alaska - These overfishing definitions separate the salmon stocks caught in the southeast Alaska (SEAK) EEZ into three tiers. Tier 1 stocks are chinook stocks covered by the Pacific Salmon Treaty (PST)[1]. The overfishing definition is based on a harvest based on a relationship between a pre-season relative abundance index generated by the Pacific Salmon

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[1]Chapter 3 of Annex IV of the Pacific Salmon Treaty (PST) as amended June 30, 1999 (also referred to as the US/Canada bilateral agreement for the Southeast Alaska all-gear chinook catch)

Commission's Chinook Technical Committee and a harvest control rule specified in the PST. Tier 2 are coho salmon stocks. Tier 3 stocks are coho, pink, chum, and sockeye salmon stocks managed as mixed-species complexes, with coho salmon stocks as indicator stocks.

Tier 1: Chinook stocks

1) Under the PST, the MSY control rule consists of a segmented linear relationship between catch and relative abundance.

2) The fishing mortality rate for these stocks is expressed as cumulative catch per generation time:

3) The maximum fishing mortality threshold is 1.075 times the fishing mortality rate associated with the MSY control rule.

4) Should the fishing mortality rate exceed the MFMT in any year, it will be determined that the stocks are being subjected to overfishing.

5) The productive capacity of a stock group is measured as the sum of the indicator stocks' escapements from the most recent generation.

6) The minimum stock size threshold for a stock group is equal to one-half the sum of the indicator stocks' MSY escapement goals from the most recent generation, where each MSY escapement goal is set at the midpoint of the respective escapement goal range established by the Chinook Technical Committee.

7) Should a stock group's productive capacity fall below the MSST in any year, it will be determined that the stock group is overfished.

Tier 2: Coho stocks managed as individual units

1) The MSY control rule is of the "constant escapement" form. Specifically, the catch corresponding to the control rule in any given year is equal to the amount that would result in a post-harvest run size equal to the MSY escapement goal, unless the pre-harvest run size fails to exceed the MSY escapement goal, in which case the catch corresponding to the control rule is zero.

2) The fishing mortality rate for these stocks is expressed as an exploitation rate, and is computed as a weighted average of run-specific exploitation rates observed in the stock from the most recent generation.

3) The maximum fishing mortality threshold for these stocks is computed as a weighted average of run-specific exploitation rates corresponding to the MSY control rule from the most recent generation.

4) Should the fishing mortality rate exceed the MFMT in any year, it will be determined that the stock is being subjected to overfishing.

5) The productive capacity of a stock is measured as the sum of the stock's escapements from the most recent generation.

6) The minimum stock size threshold for a stock is equal to one-half the sum of the stock's MSY

escapement goals from the most recent generation.

7) Should a stock's productive capacity fall below the MSST in any year, it will be determined that the stock is overfished.

Tier 3: Coho, sockeye, pink, and chum salmon stocks managed as complexes

The MSY control rule is of the "constant escapement" form. The difference with respect to Tier 2 is not the *form* of the control rule, but rather the level of aggregation at which it is applied. Using the same definitions and criteria described under Tier 2, a determination that one or more indicator coho stocks is being subjected to overfishing or is overfished will constitute a determination that the respective stock complex is being subjected to overfishing or is overfished, except that overfishing of one or more stocks in a stock complex may be permitted, and will not result in a determination that the entire stock complex is being subjected to overfishing, under the conditions set forth in 50 CFR §600.310(d)(6)).

Pink Salmon, Sockeye Salmon, Chum Salmon, Coho Salmon, Chinook Salmon - A stock is overfished when fishing results in the chronic inability to maintain escapements within the stock's escapement target. Escapement targets are set by Alaska Department of Fish and Game and the U.S.-Canada Pacific Salmon Commission so that escapement will not be significantly less than needed to produce MSY. Escapement targets for major stocks of Alaska salmon are continuously evaluated based on new information. The overfishing definition notwithstanding, it is recognized that failure to meet spawner escapements may also be the result of nonfishing mortality and that fishery management actions may not adequately address the situation.

Bering Sea / Aleutian Islands Groundfish - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Eastern Bering Sea Walleye Pollock, Aleutian Islands Walleye Pollock, Bogoslof Walleye Pollock, Pacific Cod, Yellowfin Sole, Greenland Turbot, Arrowtooth Flounder, Rock Sole, Flathead Sole, Eastern Bering Sea Sablefish, Aleutian Islands Sablefish, Eastern Bering Sea Pacific Ocean Perch, Aleutian Islands Pacific Ocean Perch, Atka Mackerel, Alaska Plaice, Squid Berryteuthis magister, Squid Onychoteuthis borealijaponicus, Longspine Thornyhead, Shortspine Thornyhead, Northern Rockfish, Bering Flounder, Kamchatka Flounder, Sharpchin Rockfish, Shortraker Rockfish, Rougheye Rockfish, Arctic Flounder, Butter Sole, C-O Sole, California Tonguefish, Curlfin Sole, Deepsea Sole, Dover Sole, English Sole, Hybrid Sole, Longhead Dab, Pacific Sanddab, Petrale Sole, Rex Sole, Roughscale Sole, Sand Sole, Slender Sole, Starry Flounder, Aurora Rockfish, Black Rockfish, Blackgill Rockfish, Blue Rockfish, Bocaccio, Brown Rockfish, Canary Rockfish, Chameleon Rockfish, Chilipepper, Copper Rockfish, Darkblotched Rockfish, Dusky Rockfish, Gray Rockfish, Greenstriped Rockfish, Harlequin Rockfish, Pink Rose Rockfish, Pygmy Rockfish, Redbanded Rockfish, Redstripe Rockfish, Rosethorn Rockfish, Rosy Rockfish, Silvergrey Rockfish, Splitnose Rockfish, Stripetail Rockfish, Tiger Rockfish, Vermilion Rockfish, Widow Rockfish, Yelloweye Rockfish, Yellowmouth Rockfish, Yellowtail Rockfish, Broad Banded Thornyhead, Antlered Sculpin, Armorhead Sculpin, Bigmouth Sculpin, Blackfin Sculpin, Blob Sculpin, Brown Irish Lord, Butterfly Sculpin, Calico Sculpin, Crested Sculpin, Dusky Sculpin, Great Sculpin, Pacific Staghorn Sculpin, Plain Sculpin, Red Irish Lord, Ribbed Sculpin, Scissortail Sculpin, Shorthorn Sculpin, Spinyhead Sculpin, Tadpole Sculpin, Thorny Sculpin, Warty Sculpin,

Yellow Irish Lord, Alaska Skate, Aleutian Skate, Bering Skate, Big Skate, Black Skate, Commander Skate, Deepsea Skate, Golden Skate, Longnose Skate, Mud Skate, Okhotsk Skate, White-Blotched Skate, Whitebrow Skate, Pacific Sleeper Shark, Salmon Shark, Spiny Dogfish Shark, Octopus Octopus dofleini, Octopus Opisthoteuthis california) - Overfishing is defined as any rate of fishing in excess of the maximum fishing mortality threshold (MFMT). The catch corresponding to fishing at a rate equal to the MFMT is referred to as the "overfishing level" (OFL). This MFMT is prescribed through a set of six tiers [which are listed in Appendix 5] in descending order of preference, corresponding to descending order of information availability. The SSC will have final authority for determining whether a given item of information is "reliable" for the purpose of this definition, and may use either objective or subjective criteria in making such determinations. For tier (1), a "pdf" refers to a probability density function. For Tiers 1-2, if a reliable pdf of B_{MSY} is available, the preferred point estimate of B_{MSY} is the geometric mean of its pdf. For Tiers 1-5, if a reliable pdf of B is available, the preferred point estimate is the geometric mean of its pdf. For Tiers 1-3, the coefficient α is set at a default value of 0.05, with the understanding that the SSC may establish a different value for a specific stock or stock complex as merited by the best available scientific information. For Tiers 2-4, a designation of the form "$F_{X\%}$" refers to the F associated with an equilibrium level of spawning per recruit (SPR) equal to X% of the equilibrium level of spawning per recruit in the absence of any fishing. If reliable information sufficient to characterize the entire maturity schedule of a species is not available, the SSC may choose to view SPR calculations based on a knife-edge maturity assumption as reliable. For Tier 3, the term $B_{40\%}$ refers to the long-term average biomass that would be expected under average recruitment and $F=F_{40\%}$.

A stock is overfished when it falls below its minimum stock size threshold (MSST), defined as whichever of the following is greater: ½ the MSY stock size, or the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years if the stock were exploited at the MFMT. The MSY level is interpreted as B_{MSY} in Tiers 1-2 and $B_{35\%}$ in Tier 3. No MSY level, and therefore no MSST, can be specified for Tiers 4-6.

Bering Sea / Aleutian Islands King and Tanner Crabs - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Blue King Crab (Pribilof Islands, Saint Matthew Island, Saint Lawrence Island), Golden King Crab (Aleutian Islands, Pribilof Islands, Northern District), Red King Crab (Bristol Bay, Norton Sound, Pribilof Islands, Aleutian Islands), Aleutian Islands Scarlet King Crab, Bering Sea Snow Crab, Tanner Crab [Bering Sea, Bering Sea Triangle, Bering Sea Grooved, Eastern Aleutian Islands, Eastern Aleutian Islands Triangle, Eastern Aleutian Islands Grooved, Adak (Western Aleutians), Western Aleutian Islands Grooved] -Overfishing is defined as any rate of fishing mortality in excess of M, where M = 0.2 for all species of king crab and M = 0.3 for all *Chionoecetes* species.

A stock is overfished when it falls below the minimum stock size threshold (MSST), which is equal to ½ the MSY stock size. MSY stock size equals the average mature biomass observed over the past 15 years, from 1983-1997.

Alaska Scallop - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Overfishing is defined as level of fishing mortality that jeopardizes the long-term capacity of a stock or stock complex to produce MSY on a continuing basis Overfishing is established as a fishing rate in excess of the natural mortality rate (M). Hence, $F_{overfishing} \geq M=0.13$. MSY is the largest long-term average catch that can be taken from a stock under prevailing ecological and environmental conditions. MSY for weathervane scallops is 1.24 million pounds of shucked adductor muscles. MSY is calculated based on the average catch from 1990-1997 (1995 data not included as only an abbreviated scallop season occurred). MSY control rule is a harvest strategy expected to result in a long-term average catch approximating MSY. The MSY control rule is based on natural mortality, using the estimate of M=0.13, the MSY control rule is $F_{msy}=M$. No control rule for spiny, pink, or rock scallops is recommended at this time.

A stock is overfished when it falls below the minimum stock size threshold (MSST), which is equal to ½ MSY stock size = 4.76 million pounds.

Atlantic Billfishes - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Blue Marlin (North Atlantic), White Marlin (North Atlantic), Sailfish (West Atlantic), Spearfish (West Atlantic) – Overfishing occurs when the MFMT exceeds F_{MSY}. The relative fishing mortality rates are as follows: Blue Marlin (North Atlantic) ($F_{1995}/F_{MSY} = 1.21$), White Marlin (North Atlantic) ($F_{1995}/F_{MSY} = 2.37$), and Sailfish ($F_{1995}/F_{MSY} = 1.4$).

A stock is overfished when the stock biomass level falls below the MSST, which is set at $(1\text{-}M)B_{MSY}$, where M is the instantaneous natural mortality rate. The relative biomass levels are as follows: Blue Marlin (North Atlantic) ($B_{1996}/B_{MSY} = 0.608$), White Marlin (North Atlantic) ($B_{1996}/B_{MSY} = 0.321$), and Sailfish / Spearfish (West Atlantic) ($B_{1992/96}/B_{MSY} = 0.62$).

Atlantic Tunas, Swordfish, and Sharks - The following overfishing definition has been fully approved under SFA guidelines and was used to make the assessments contained in this report. The definition contains both a fishing mortality rate (F) and biomass (B) component.

Bigeye Tuna (Atlantic), Albacore (North Atlantic), Bluefin Tuna (West Atlantic), Swordfish (North Atlantic), Sandbar Shark, Blacktip Shark, Dusky Shark, Spinner Shark, Silky Shark, Bull Shark, Bignose Shark, Narrowtooth Shark, Galapagos Shark, Night Shark, Caribbean Reef Shark, Tiger Shark, Lemon Shark, Sand Tiger Shark, Bigeye Sand Tiger Shark, Nurse Shark, Scalloped Hammerhead Shark, Great Hammerhead Shark, Smooth Hammerhead Shark, Whale Shark, Basking Shark, White Shark, Yellowfin Tuna (West Atlantic), Atlantic Sharpnose Shark, Caribbean Sharpnose Shark, Finetooth Shark, Blacknose Shark, Smalltail Shark, Bonnethead Shark, Atlantic Angel Shark, Skipjack Tuna (West Atlantic), Shortfin Mako Shark, Longfin Mako Shark, Porbeagle Shark, Thresher Shark, Bigeye Thresher Shark, Blue Shark, Oceanic Whitetip

Shark, Sevengill Shark, Sixgill Shark, Bigeye Sixgill Shark, **Iceland Cat Shark, Smallfin Cat Shark, Deepwater Cat Shark, Broadgill Cat Shark, Marbled Cat Shark, Blotched Cat Shark, Chain Dogfish, Dwarf Catshark, Japanese Gulper Shark, Gulper Shark, Little Gulper Shark, Kitefin Shark, Flatnose Gulper Shark, Portuguese Shark, Greenland Shark, Lined Lanternshark, Broadband Dogfish, Caribbean Lanternshark, Great Lanternshark, Smooth Lanternshark, Fringefin Lanternshark, Green Lanternshark, Cookiecutter Shark, Bigtooth Cookiecutter, Smallmouth Velvet Dogfish, Pygmy Shark, Roughskin Spiny Dogfish, Blainville's Dogfish, Cuban Dogfish, Bramble Shark, American Sawshark, Florida Smoothhound, Smooth Dogfish** - Overfishing occurs when the MFMT is exceeded, which is set at $F_{limit} = F_{MSY}$. The relative fishing mortality rates (F_{year}/F_{MSY}) are as follows: North Atlantic Swordfish (F_{98}/F_{msy}=1.34), West Atlantic Bluefin Tuna (F_{97}/F_{MSY} two-line = 1.73), Bigeye Tuna (F_{98}/F_{MSY} = 1.50 - 1.82), North Atlantic Albacore Tuna (F_{97}/F_{MSY} = 1.39 (uncertain)), Yellowfin Tuna (F_{97}/F_{MSY} = variable, probably exceeds 1.0), Blacktip Shark (F_{97}/F_{MSY} = 3.52 (baseline)), Sandbar Shark (F_{97}/F_{MSY} = 2.70 (baseline)), Large Coastal Sharks (F_{97}/F_{MSY} = 6.34 (baseline)), and Small Coastal Sharks ($F_{86\text{-}91}/F_{MSY}$ = 0.89).

A stock is overfished when the stock level biomass falls below MSST, which is set at $MSST = B_{limit} = (1\text{-}M)B_{MSY}$ when $M < 0.5$; $MSST = B_{limit} = 0.5B_{MSY}$ when $M \geq 0.5$. For Yellowfin Tuna, $MSST = 0.5B_{MSY}$. The relative biomass levels are as follows: (B_{year}/B_{MSY}) for North Atlantic Swordfish (B_{98}/B_{MSY} = 0.65), West Atlantic Bluefin Tuna (SSB_{97}/SSB_{MSY} two-line = 0.48), Bigeye Tuna (B_{98}/B_{MSY} = 0.57-0.63), North Atlantic Albacore Tuna (B_{97}/B_{MSY} = 0.47 (0.34-0.63)), Yellowfin Tuna (B_{97}/B_{MSY} = 0.92-1.35), Blacktip Shark* (N_{98}/N_{MSY} = 0.50 (baseline)), Sandbar Shark* (N_{98}/N_{MSY} = 0.58 (baseline)), Large Coastal Sharks* (N_{98}/N_{MSY} = 0.30 (baseline)), and Small Coastal Sharks (B_{91}/B_{MSY} = 1.12).

*N is the number of fish, rather than biomass or yield in weight.

APPENDIX 3. OVERFISHING DEFINITIONS FOR SPECIES NOT CONTAINED IN FEDERAL FISHERY MANAGEMENT PLANS

American Lobster - The following overfishing definition was approved under pre-SFA guidelines and the assessments contained in this report are based on this definition. This definition contains only a fishing mortality rate (F) component.

The American lobster resource is considered recruitment overfished when, throughout its range, the fishing mortality rate (F), given the regulations in place at that time under the suite of regional management measures, results in a reduction in estimated egg production per recruit to 10% or less of a non-fished population (F 10%).

Atlantic Menhaden - The overfishing definition contained in the FMP has F-based and SSB-based benchmarks. The F-based benchmarks are $F_{threshold} = 1.3$ and $F_{target} = 1.0$, and the SSB-based benchmarks are $SSB_{threshold} = 20{,}570$ mt and $SSB_{target} = 37{,}400$ mt.

Northern Shrimp - There is currently no approved ASMFC overfishing definition, however, the SARC has recommended an interim management target F(1999-2000) = 0.34 = F40%.

Tautog - The overfishing definition is contained in the ASMFC Tautog FMP and was used to make the assessment contained in this year's report. This definition contains only a fishing mortality rate (F) component.

Overfishing occurs when F exceeds the threshold, or the interim, fishing rate of 0.24. The FMP established a target fishing rate equal to that of natural mortality (F=M=0.15).

Weakfish - The overfishing definition contained in the FMP under development has not been formally approved, but was used to make the assessment regarding stock level in this year's report.

A stock is overfished when the biomass is less than B_{MSY}. The best available estimate of B_{MSY} proxy is 53,6000 mt.

Pacific Halibut - A rate of fishing that exceeds the constant exploitation yield. The constant exploitation yield is computed using a harvest rate of 0.20 of the exploitable biomass (8-year+ Pacific halibut).

APPENDIX 4. OVERFISHING DEFINITIONS FROM FISHERY MANAGEMENT PLANS UNDER DEVELOPMENT

Skates

The following overfishing definitions have not been approved, but are the working definitions that currently exist in the FMP under development. The regular stock assessment process was used to assess these stocks and status determinations were made on the basis of these proposed overfishing definitions.

Winter Skate - Overfishing exists when F is greater than F=M=0.10, the SFA threshold fishing mortality reference point.

A stock is overfished when the biomass is below the 75th percentile value of the NEFSC autumn biomass indices for the Gulf of Maine / Middle Atlantic offshore region during 1967-1998. The best available estimate of B_{msy} proxy is 6.46 kg/tow (SAW-30, 2000).

Barndoor Skate - There is no overfishing definition contained in the FMP under development.

A stock is overfished when the biomass is below the mean value of the NEFSC autumn biomass indices for the Gulf of Maine / Southern New England offshore region during 1963-1966. The best available estimate of B_{msy} proxy is 1.62 kg/tow (SAW-30, 2000).

Thorny Skate - There is no overfishing definition contained in the FMP under development.

A stock is overfished when the biomass is below the 75th percentile value of the NEFSC autumn biomass indices for the Gulf of Maine / Southern New England offshore region during 1963-1998**.** The best available estimate of B_{msy} proxy is 4.4 kg/tow (SAW-30, 2000).

Smooth Skate - There is no overfishing definition contained in the FMP under development.

A stock is overfished when the biomass is below the 75th percentile value of the NEFSC autumn biomass indices for the Gulf of Maine / Southern New England offshore region during 1963-1998**.** The best available estimate of B_{msy} proxy is 0.32 kg/tow (SAW-30, 2000).

Little Skate - Overfishing exists when F is greater than F=M=0.40, the SFA threshold fishing mortality reference point.

A stock is overfished when the biomass is below the 75th percentile value of the NEFSC autumn biomass indices for the Gulf of Maine / Middle Atlantic offshore region during 1982-1999**.** The best available estimate of B_{msy} proxy is 6.54 kg/tow (SAW-30, 2000).

Clearnose Skate - There is no overfishing definition contained in the FMP under development**.**

A stock is overfished when the biomass is below the 75th percentile value of the NEFSC autumn biomass indices for the Middle Atlantic inshore and offshore regions during 1975-1998. The best available estimate of B_{msy} proxy is 0.56 kg/tow (SAW-30, 2000).

Rosette Skate - There is no overfishing definition contained in the FMP under development**.**

A stock is overfished when the biomass is below the 75th percentile value of the NEFSC autumn biomass indices for the Middle Atlantic offshore region during 1967-1998. The best available estimate of B_{msy} proxy is 0.03 kg/tow (SAW-30, 2000).

APPENDIX 5. SIX TIERS COMPRISING THE OVERFISHING DEFINITION FOR GULF OF ALASKA AND BERING SEA /ALEUTIAN ISLANDS GROUNDFISH

See Appendix 5 for definitions of acronyms used in this appendix.

1) Information available: Reliable point estimates of B and B_{MSY} and reliable pdf of F_{MSY}.

1a) Stock status: $B/B_{MSY} > 1$

$F_{OFL} = \mu_A$, the arithmetic mean of the pdf

$F_{ABC} \leq \mu_H$, the harmonic mean of the pdf

1b) Stock status: $\alpha < B/B_{MSY} \leq 1$

$F_{OFL} = \mu_A \times (B/B_{MSY} - \alpha) / (1 - \alpha)$

$F_{ABC} \leq \mu_H \times (B/B_{MSY} - \alpha) / (1 - \alpha)$

1c) Stock status: $B/B_{MSY} \leq \alpha$

$F_{OFL} = 0$

$F_{ABC} = 0$

2) Information available: Reliable point estimates of B, B_{MSY}, F_{MSY}, $F_{35\%}$, and $F_{40\%}$.

2a) Stock status: $B/B_{MSY} > 1$

$F_{OFL} = F_{MSY}$

$F_{ABC} \leq F_{MSY} \times (F_{40\%}/F_{35\%})$

2b) Stock status: $\alpha < B/B_{MSY} \leq 1$

$F_{OFL} = F_{MSY} \times (B/B_{MSY} - \alpha) / (1 - \alpha)$

$F_{ABC} \leq F_{MSY} \times (F_{40\%}/F_{35\%}) \times (B/B_{MSY} - \alpha) / (1 - \alpha)$

2c) Stock status: $B/B_{MSY} \leq \alpha$

$F_{OFL} = 0$

$F_{ABC} = 0$

3) Information available: Reliable point estimates of B, $B_{40\%}$, $F_{35\%}$, and $F_{40\%}$.

3a) Stock status: $B/B_{40\%} > 1$

$F_{OFL} = F_{35\%}$

$F_{ABC} \leq F_{40\%}$

3b) Stock status: $\alpha < B/B_{40\%} \leq 1$

$F_{OFL} = F_{35\%} \times (B/B_{40\%} - \alpha) / (1 - \alpha)$

$F_{ABC} \leq F_{40\%} \times (B/B_{40\%} - \alpha) / (1 - \alpha)$

3c) Stock status: $B/B_{40\%} \leq \alpha$

$F_{OFL} = 0$

$F_{ABC} = 0$

4) Information available: Reliable point estimates of B, $F_{35\%}$, and $F_{40\%}$.

$F_{OFL} = F_{35\%}$

$F_{ABC} \leq F_{40\%}$

5) Information available: Reliable point estimates of B and natural mortality rate M.

$F_{OFL} = M$

$F_{ABC} \leq 0.75 \times M$

6) Information available: Reliable catch history from 1978 through 1995.

OFL = the average catch from 1978 through 1995, unless an alternative value is established by the SSC on the basis of the best available scientific information.

$ABC \leq 0.75 \times OFL$

APPENDIX 6. ACRONYMS USED IN APPENDICES

α - The threshold stock size .05.

ABC - Allowable Biological Catch - A term that refers to the range of allowable catch for a species or species group. It is set each year by a scientific group. The ABC estimates are used to set the annual total allowable catch (TAC).

ASMFC - Atlantic States Marine Fisheries Commission - Serves as a deliberative body of the Atlantic coastal states, coordinating the conservation and management of nearshore fishery resources, including marine, shell, and anadromous species.

B - The weight (biomass) of a group of fish.

B_{MSY} - The weight (biomass) of a group of fish necessary to produce MSY.

CFMC - Caribbean Fishery Management Council.

CPUE - Catch Per Unit of Effort - The number of fish caught by an amount of effort. Typically, effort is a combination of gear type, gear size, and length of time gear is used. Catch per unit of effort is often used as a measurement of relative abundance.

EEZ - Exclusive Economic Zone - All waters from the seaward boundary of coastal states out to 200 nautical miles.

EPR - Eggs-Per-Recruit - The average number of eggs produced by an individual fish that has been recruited, i.e., that moved into a certain class, such as the spawning class or fishing-size class. Used as an index of abundance.

F - Fishing Mortality Rate - A measurement of the rate of removal of fish from a population by fishing. Fishing mortality rate can be reported as either annual or instantaneous. Annual mortality is the percentage of fish dying in one year. Instantaneous mortality is that percentage of fish dying at any one point in time.

F_{ABC} - The level of fishing mortality that results in the allowable biological catch.

F_{MAX} - The level of fishing mortality that results in the greatest yield from the fishery.

F_{MSY} - The level of fishing mortality that results in the maximum sustainable yield.

F_{OF} - The level of fishing mortality defined as overfishing.

F_{OFL} - The level of fishing mortality associated with the average catch from 1978 through 1995 for Gulf of Alaska Groundfish and Bering Sea / Aleutian Islands Groundfish.

$F_{20\%}$ - The level of fishing mortality that results in a spawning potential ratio of 20% of the maximum.

$F_{25\%}$ - The level of fishing mortality that results in a spawning potential ratio of 25% of the maximum.

$F_{30\%}$ - The level of fishing mortality that results in a spawning potential ratio of 30% of the maximum.

$F_{40\%}$ - The level of fishing mortality that results in a spawning potential ratio of 40% of the maximum.

$F_{0.1}$ - The point on the spawning per recruit curve at which the level of spawning per recruit is 35% of 40% of the maximum.

FMP - Fishery Management Plan - A plan to achieve specified management goals for a fishery prepared under the authority of the Magnuson-Stevens Fishery Conservation and Management Act.

GMFMC - Gulf of Mexico Fishery Management Council.

GSMFC - Gulf States Marine Fisheries Commission - Serves as a deliberative body of the Gulf of Mexico coastal states, coordinating the conservation and management of nearshore fishery resources, including marine, shell, and anadromous species.

HMS - Highly Migratory Species Division - Develops fishery policies designed to manage any highly migratory species (tuna species, marlin, oceanic sharks, sailfishes, and swordfish) fishery that is within the geographical authority of more than one Council.

MAFMC - Middle-Atlantic Fishery Management Council.

MFMT – Maximum Fishing Mortality Threshold – The level or rate of fishing mortality, that if exceeded, will result in overfishing and jeopardize the capacity of a stock or stock complex to produce MSY on a continuing basis.

MSP - Maximum Spawning Potential - See SPR.

MSST – Minimum Stock Size Threshold – The minimum size of the stock or stock complex that is required to produce MSY, below which the stock would be considered overfished. The threshold should equal whichever of the following is greater: ½ the MSY stock size, or the minimum stock size at which rebuilding to the MSY level would be expected to occur within 10 years if the stock or stock were exploited at the maximum fishing mortality threshold.

MSY - Maximum Sustainable Yield - The largest long-term average catch or yield that can be taken from a stock or stock complex under prevailing ecological and environmental conditions.

NEFMC - New England Fishery Management Council.

NEFSC - NMFS, Northeast Fisheries Science Center.

NPFMC - North Pacific Fishery Management Council.

OY - Optimum Yield - The amount of fish that: (1) will provide the greatest overall benefit to the Nation, particularly with respect to food production and recreational opportunities, and taking into account the protection of marine ecosystems; (2) is prescribed on the basis of the MSY from the fishery, as reduced by any relevant economic, social, or ecological factors; (3) in the case of an overfished fishery, provides for rebuilding to a level consistent with producing the MSY in such fishery.

pdf - Probability Density Function - A description of the probability that a variable takes a specified value.

PFMC - Pacific Fishery Management Council.

SAFE - Stock Assessment and Fishery Evaluation - A document or set of documents that provides Councils with a summary of the most recent biological condition of species in the fishery management unit, and the social and economic condition of the recreational and commercial fishing interests and the fish processing industries. It summarizes, on a periodic basis, the best available scientific information concerning the past, present, and possible future condition of the stocks and fisheries being managed under Federal regulation.

SAFMC - South Atlantic Fishery Management Council.

SARC - Stock Assessment Review Committee.

SPR - Spawning Potential Ratio - The number of eggs that could be produced by an average recruit in a fished stock, divided by the number of eggs that could be produced by an average recruit in an unfished stock. SPR can also be expressed as the spawning stock biomass per recruit (SSBR) of a fished stock divided by the SSBR of the stock before it was fished.

SSB - Spawning Stock Biomass - The total weight of the fish in a stock that are old enough to spawn.

SSBR - Spawning Stock Biomass Per Recruit - The spawning stock biomass divided by the number of recruits to the stock, or how much spawning biomass an average recruit would be expected to produce.

SSC - Scientific and Statistical Advisory Committee - A group of scientific and technical people giving advice to a council.

WPFMC - Western Pacific Fishery Management Council.